Quantifying Sprawl In Chester County. PA

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Abstract

This paper explores the spatial distribution of different severities of sprawl throughout Chester County. This is done through statistics and spatial analysis. The study demonstrates how simple indicators can provide insight on the analysis of development and human-driven externalities. Based on a ranking system in which all four of the unique indicators were weighed equally and ranked accordingly, results produced findings depicting which areas in Chester County suffer the most from sprawl. Four indicators of sprawl have been developed (percentage of development built before 1939, average commute times, average vehicles per home, and housing density) and the investigated county sub divisions classified accordingly. All indicators found correlated to sprawl and its effects in areas classified as suburban. Seventy-three ranks were produced and have been identified based on the four sprawl indicators. Results suggest that the spatial distribution of sprawl in Chester County reflects the transition from a compact urban form to a polycentric and dispersed development pattern, with implications for future development practices.

Results

The results indicate that New London Township, with a sum-of-ranks score of 42 was the most sprawled county sub-division in Chester County, Pa. New London Township had a resulting Z-score of -2.165 which is interpreted to mean that it exhibits sprawl characteristics to greater degree than any of the other sub-divisions. In this data set, New London Township is the only community that can be designated as most sprawled. At the other end of the spectrum, Coatesville City had the lowest degree of sprawl according to my calculations. Table A depicts the descriptive statistics for the County as whole.

Descriptive Statistics

% of Buildings Built Before 1939

Mean	0.18%
ST. Dev	0.139
Median	0.13%
Range	0% -.60%

Average Commute Time

Mean	29.45 minutes
ST. Dev	3.53
Median	29.56 minutes
Range	20 - 36.64 minutes

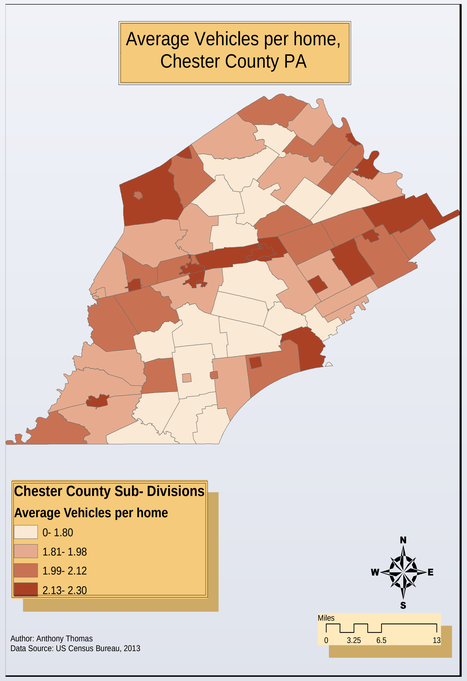
Vehicle Ownership

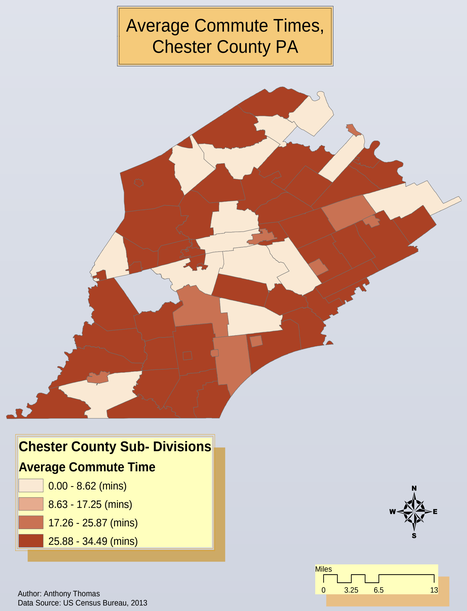
Mean	1.92 cars
ST. Dev	0.236
Median	1.96 cars
Range	1.14 - 2.30 cars

Housing Density

Mean	435.46 homes/mile
ST. Dev	593.19
Median	22.81 homes/mile
Range	12.53 - 2914.29 homes/miles

Geographic Variation of Indicators





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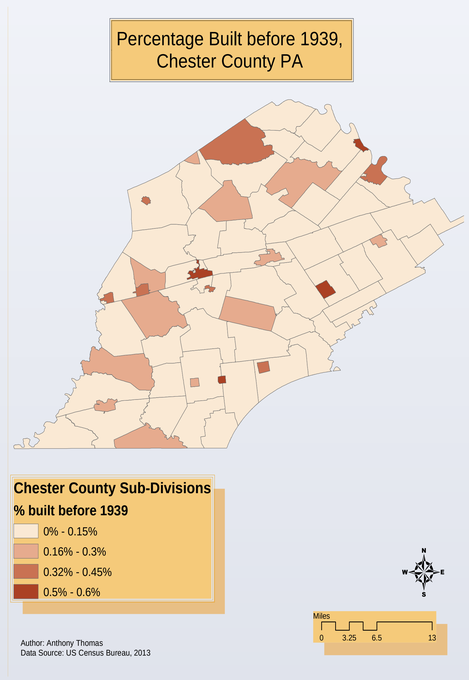
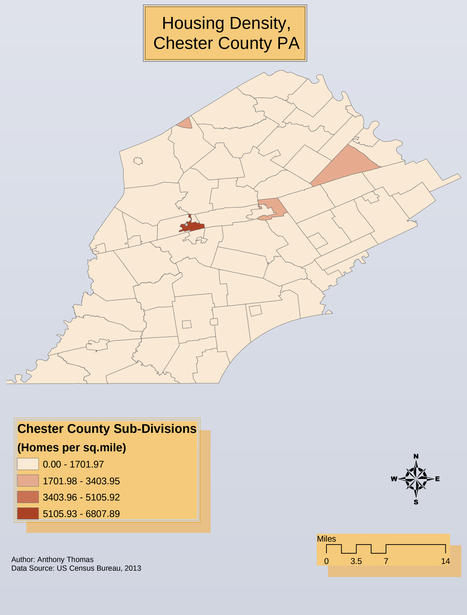
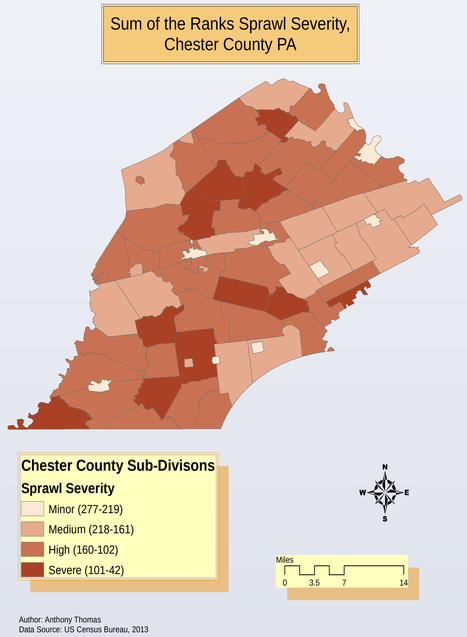




Sprawl Severity Map

Sum of the Ranks Findings



Conclusion

In conclusion this body of work has the potential to influence development patterns and behaviors. A change in behaviors and development patterns can ultimately shape the built environment around us and better our standard of living. A thorough, multidimensional analysis of sprawl is needed in order to ameliorate its externalities. If transportation planners and civil engineers alike take notice of which development patterns produce sprawl and counter these patterns, a higher standard of living can be achieved. This is true also for commuters. Behaviors must be changed also in order for the ultimate elimination of sprawl.